

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (ALLOWED) A method for planarizing a borophosphosilicate glass (BPSG) layer deposited over a substrate, said method comprising:
loading a substrate having a BPSG layer deposited thereover into a substrate processing chamber, said BPSG layer having a non-planar upper surface;
maintaining a temperature in the substrate processing chamber between about 20 degrees Celsius and about 100 degrees Celsius; and
exposing said substrate to an ultraviolet (UV) light at conditions sufficient to cause a reflow of said BPSG so that said upper surface comprises a planar upper surface portion as a result of the reflow.
2. (ALLOWED) The method as in claim 1, further comprising producing said UV light with a UV lamp.
3. (ALLOWED) The method as in claim 1, further comprising producing said UV light with a laser.
4. (ALLOWED) The method as in claim 1, wherein said UV light has a wavelength of about $150 \text{ nm} \pm 50 \text{ nm}$.
5. (ALLOWED) The method as in claim 1, wherein said UV light has an energy level that is greater than about 10 electron volts (eV).
6. (ALLOWED) The method as in claim 1, wherein said UV light has an energy level that is about 15 eV.

7. (ALLOWED) The method as in claim 1, wherein said exposing step has a duration that is between about thirty (30) seconds and about fifteen (15) minutes.

Claim 8 previously canceled.

9. (ALLOWED) The method as in claim 1, wherein said exposing step comprises exposing said substrate to said UV light having a desired wavelength and a desired energy level to break at least some SiOH bonds in said BPSG layer.

10. (ALLOWED) The method as in claim 1, wherein said exposing step densifies said BPSG layer.

11. (ALLOWED) The method as in claim 1, wherein said BPSG layer comprises a premetal dielectric (PMD) layer.

Please cancel claim 12.

13. (Once amended herein) A method for planarizing an insulating layer deposited over a substrate, said method comprising:
providing said substrate having said insulating layer deposited thereover;
providing a UV light source;
exposing said substrate to UV light from said UV light source; and
maintaining said UV light at an energy level that is at least about 10 eV for a duration that is at least about 30 seconds to reflow said insulating layer to produce a planar portion of the insulating layer upper surface;

[The method as in claim 12,] wherein said insulating layer comprises borophosphosilicate glass (BPSG).

14. (Previously once amended) The method as in claim 13, wherein said maintaining step comprises maintaining said UV light at an energy level that is at least about 10 eV for a duration that is between about 30 seconds and about fifteen minutes to produce said reflow of said BPSG.

15. (As filed) The method as in claim 13, wherein said maintaining step comprises maintaining said UV light at a wavelength of about 150 nm and for a duration that is at least about 30 seconds.

Please cancel claim 16.

17. (Once amended herein) A method of forming a planarized insulating layer, said method comprising:
providing a substrate having a non-planar upper surface;
depositing an insulating layer over said upper surface, said
insulating layer having a non-planar upper surface; and
exposing said insulating layer to a UV light at conditions sufficient
to cause said insulating layer to reflow so that said insulating layer upper surface
comprises a planar upper surface portion, wherein the substrate is maintained in a
processing chamber at a temperature between about twenty (20) degrees Celsius and
about one hundred (100) degrees Celsius during the exposing;

[The method as in claim 16,] wherein said insulating layer comprises borophosphosilicate glass (BPSG).

18. (As filed) The method as in claim 17, wherein said depositing step comprises:

inserting said substrate into a substrate processing chamber; and
introducing a phosphorus-containing source and a boron-containing source into said processing chamber to deposit said BPSG insulating layer over said substrate.

19. (Once amended herein) The method as in claim 20 [16], wherein said UV light has an energy level that is at least about 10 eV.

20. (Once amended herein) A method of forming a planarized insulating layer, said method comprising:

providing a substrate having a non-planar upper surface;

depositing an insulating layer over said upper surface, said insulating layer having a non-planar upper surface;

exposing said insulating layer to a UV light at conditions sufficient to cause said insulating layer to reflow so that said insulating layer upper surface comprises a planar upper surface portion, wherein the substrate is maintained in a processing chamber at a temperature between about twenty (20) degrees Celsius and about one hundred (100) degrees Celsius during the exposing; and

[The method as in claim 16, further comprising] performing said depositing and exposing steps in a substrate processing chamber.

21. (Once amended herein) The method as in claim 17 [16], further comprising performing said depositing step in a first processing chamber and said exposing step in a second processing chamber.

Claims 22-29 previously canceled.

30. (Once amended herein) The method as in claim 17 [16] wherein the substrate non-planar upper surface comprises at least one trench having an aspect ratio of about 6:1, and wherein the reflow operates to fill the trench with the insulating layer.

31. (Once amended herein) The method as in claim 20 [16] wherein the UV light has an energy level of at least about 15 eV.

32. (Once amended herein) A method of forming a planarized insulating layer, said method comprising:
providing a substrate having a non-planar upper surface;
depositing an insulating layer over said upper surface, said insulating layer having a non-planar upper surface;
exposing said insulating layer to a UV light at conditions sufficient to cause said insulating layer to reflow so that said insulating layer upper surface comprises a planar upper surface portion, wherein the substrate is maintained in a processing chamber at a temperature between about twenty (20) degrees Celsius and about one hundred (100) degrees Celsius during the exposing; and

[The method as in claim 16 further comprising] performing a chemical-mechanical polishing (CMP) process to the insulating layer upper surface after the exposing to further planarize the upper surface.

Please add the following claims:

--33. The method as in claim 20 wherein the substrate non-planar upper surface comprises at least one trench having an aspect ratio of about 6:1, and wherein the reflow operates to fill the trench with the insulating layer.

34. The method as in claim 32 further comprising performing said depositing step in a first processing chamber and said exposing step in a second processing chamber.--